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ABSTRACT

This paper describes an Elementary Secondary Education Act Title IV program designed to improve the reading achievement levels of kindergarten through second-grade pupils in Wakulla County, Florida. The Multisensory Approach to Reading and Reading Readiness Curriculum (Project MARC) combined structured teaching techniques and materials with inservice training of teachers and capitalization of home and community experiences. Evidence suggests that the impact of Project MARC is significant in that it emphasizes early intervention and a sequential, developmental reading approach; it provides a viable alternative program for rural or low-socioeconomic, low-achieving students for whom commercial materials might not be suitable; it meets the critical need for reading achievement; and it is capable of teaching skills during the school year which are maintained over the summer months. (RS)

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Application for Dissemination Review Panel

Project MARC

ESEA Title IV-C

Wakulla County School Board

Crawfordville, Florida

1976

CS003053

APPLICATION FOR PRESENTATION TO THE DISSEMINATION REVIEW PANEL

A. PROJECT INFORMATION

Area of concern Reading Education
(e.g., Career Education, Handicapped, Reading, etc.)

Project Title Multisensory Approach to Reading & Reading Readiness Curriculum

Project Director's Name Frances K. Kochan (Mrs.)

P.O. Box 98, Crawfordville Florida 32327
Address City State Zip Code

Phone Number (include area code) 904/926-7909

Application Agency School Board of Wakulla County

Location P.O. Box 98, Crawfordville, Florida 32327
(Street Address) (City) (State) (Zip Code)

Superintendent's Name William E. Whaley

P.O. Box 98 Crawfordville, Florida 32327
Address City State Zip Code

Phone Number (include area code) 904-926-7133

Project Period: Beginning June 30, 1972; Ending June 30, 1976
date date

Expenditures:

Grant Period	Federal Funds	Other Funds	Total Funds
6/23/72 to 6/30/73	$ 73,784.00	$ --	$ 73,784.00
7/1/73 to 6/30/74	$ 122,860.00	$ --	$ 122,860.00
7/1/74 to 6/30/75	$ 186,189.00	$ --	$ 186,189.00
7/1/75 to 6/30/76	$ 186,395.00	$ --	$ 186,395.00
TOTAL	$ 569,228.00	--	569,228.00

B. PROJECT DESCRIPTION

Background Statement - In the spring of 1971, a survey of students in Crawfordville School in the Wakulla County School System, revealed that 89% of all second grade students were reading below grade level based on scores of the Gates MacGinitie Reading Test.

The mean score of these children was at the 16th percentile in vocabulary and the 19th percentile in comprehension. Scores on the Slosson Intelligence Test indicated that the population had normal mean and median scores. Sub-populations within the county schools are similar, so these findings were considered to be accurate for the entire county school population.

On-site observations, and consultations with teachers, specialists and administrative personnel indicated that possible causes for this discrepancy were:

1. Students were lacking in sensory and language experiences conducive to academic success.
2. Teaching materials which were available were not geared to student needs as they were not relevant in content and proceeded too rapidly in the introduction of skills, particularly at the beginning of reading stages.
3. Teachers did not have the training necessary to deal with the special needs of these children.

Goals and Objectives

A project was designed to alleviate these causes, based upon consultation and research. The major goal of the Project was to develop a K-1 readiness and reading program which would raise the reading achievement levels of the target population. Based upon the success of the project in achieving this goal, efforts have also been initiated to develop materials at the second-grade level. These materials should provide further assurance that the gains of this project will be maintained. (These materials were used with second-grade students and data collected in March, 1976. However, this data was not used in the validation application as no reliable information was available regarding equivalency of control and target groups upon initial entry into kindergarten.)

The terminal objective was that, after the completion of a two-year multisensory readiness and reading program (K-1), there would be significant differences at the .05 level between the target and control groups in reading achievement as measured on three subtests of the Stanford Early School Achievement Test.

Program Context

1. Community Characteristics

Wakulla County is located 21 miles south of Tallahassee, the state capital. There are two small incorporated towns, Sopchoppy and St. Marks, and one unincorporated town, Crawfordville.

While the population of Wakulla County was 8,635 in 1974, the overall population trend is one of increase. There has been a 25% increase in the last 10 years with an accelerating rate of growth in the last few years.

The major industries are fishing, forestry and marine-oriented occupations. Farming is also a substantial occupational activity.

Census data for 1970 shows that the median family income was $6,000. Only 14% of the population have an annual income of $10,000. or greater.

2. Student Characteristics

Wakulla County ranks 9th in the State in having the greatest percentage of adults with less than five years of schooling: 25% of the adults over 25 years of age have gone to school fewer than five years. By Bureau of Census definition, these persons are functionally illiterate. The median number of school years completed by adults over 25 years of age is 8.2.

An analysis of all of the above data and the community characteristics reveals that at least 40% of the school children in Wakulla come from low socio-economic, undereducated families.

Students are characterized as having normal I.Q. means and variance, but having pronounced deficits in both reading and readiness skills.

3. School Characteristics

There are three elementary schools and one high school in the county. The total elementary school enrollment is 1,275 students. The early elementary sub-population consists of 575 students, grades kindergarten through second. The distribution by grade level is 32% in the kindergarten, 38% in the first grade and 30% in the second grade.

Program Description

The program combines techniques and materials for grades kindergarten through two along with the inservice training of teachers. The curriculum was maintained for the traditional nine-month school year.

Materials were developed for each grade level emphasizing multisensory techniques, sequential skill development, and continual diagnosis and evaluation. It was determined that at the kindergarten level, letters and sounds would be taught through the use of multisensory methods and materials. Research collected, prior to program development indicated that this linking together of sensory abilities would broaden cognitive stimulation and thus might help increase learning achievement. A reading series utilizing small sequential steps and culturally relevant content materials was developed focusing on decoding and word attack skills at grade one and comprehension and vocabulary development at grade two.

Formative evaluation of products and program results was conducted throughout the project implementation.

The program is eclectic in nature utilizing a variety of sensory experiences in order to insure the development of all the learning modalities. Teachers are encouraged to use a wide variety of materials to provide for individual needs.

Reading is taught in small groups for one to two hours per day, usually in the morning. Classrooms are self-contained, but some team teaching does occur. Learning center classroom organization helps teachers to provide a variety of activities geared toward meeting individual needs.

Preservice and inservice teacher training was conducted throughout program implementation. Training emphasized the methodology and materials designed under the project along with classroom organization and management.

Staffing:

The operation of the program was implemented by a project director, a secretary, a production manager and two to three area specialists. Staff time was spent in creating materials, teacher training, and on-site visitations to insure proper program implementation and gain feedback regarding program effectiveness.

Facilities

The central office was located in a renovated building formerly used as a school cafeteria and contributed by the local school district.

Parental and Community Involvement

Brochures and letters were sent to parents periodically to inform them of the program; its goals and objectives. Presentations were made at Parent Teacher Organization meetings and for community groups such as the Lion's Club. Presentations were made to the School Board on a periodic basis. School Board members visited the classrooms to view program implementation first-hand during the school year.

Advisory Board

The Wakulla County Project MARC Advisory Board consisted of twenty people from various sections of the community, including parents, teachers, administrators, State Department personnel, university personnel and community leaders who displayed an interest in the educational program. Meetings were held quarterly and individuals were available for consultations as needed.

Training

Preservice training was given to teachers for one week prior to the opening of the school year. Three inservice meetings were held during the year.

Materials

The basic materials for implementation of the program are of two types; teacher training materials and materials for classroom use. They are as follows:

A. Teacher Training Materials

1. Teacher Inservice Packet - a set of training materials for use in teacher training sessions. There are seven sections, each one dealing with a separate topic including; multisensory techniques; learning centers; diagnosis and evaluation; reading; and games and activities.
2. Alphabet Sound Tapes - a set of tapes designed to familiarize teachers and trainers with beginning reading skills and proper program implementation.
3. Teacher's Guides - two guides; one for kindergarten and one for first and second grade teachers which give an overview of all materials, techniques, and classroom organization used in the program along with units designed to teach multisensory skills and reading.

B. Classroom Teaching Materials

1. Readiness
   a) Alphabet Wall Cards - a set of multicolored cards using letters and key words for all letters of the alphabet and the diagraphs.
   b) Alphabet Booklets - a series of six sheets for each letter, emphasizing visual and auditory skills.
   c) Alphabet Sound Pack - a series of small cards containing pictures beginning with all the consonant and short vowel sounds for use in games to develop readiness skills.
   d) Readiness Skill Sheets and Poetry Book - a set of poems and worksheets designed to provide reinforcement of letters and sounds.
3. Reading
   a) Reading Series - a set of sixteen readers, each with an accompanying workbook and teacher's manual. Readers one through five contain much review. Each reader emphasizes a particular letter, sound or linguistic knowledge feature. Skills follow a sequential order of development. Phonic and linquistic knowledge was used to develop the scope and sequence of skills. A teacher's planning manual contains the scope and sequence of skills for the entire series.
   b) Supplemental Materials - a set of reading skills sheets, and a set of resource sheets designed to provide reinforcement of skills was developed along with a teacher's manual.
4. Diagnosis
   a) Student Assessment Package - a set of assessemnt instruments was developed for use with each of the skills to be taught. Individual and group tests are included.
   b) Checklist of Skills - checklists of skills have been developed to aid the teacher in developing strategies for meeting student needs.

5. Optional

a) Culture-based Stories - a set of culture-based storybooks particularly relevant to a rural setting has been developed to stimulate language experiences and motivate children to read. A teacher's guide and tapes accompany the books.

b) Skill Tapes - a set of skill tapes designed to be used with the skill sheets can be used if desired.

Costs

Project MARC is built around the concept of trained classroom teachers employing a systematic approach to the teaching of readiness and reading skills while utilizing instructional materials designed to capitalize on the home and community experiences of the students served. Cost factors, then, are related to the training of teachers (both preservice and inservice) and the acquisition of instructional materials. Suggested expenditures in both areas are nominal.

The start-up costs for one classroom serving 25 students is $317.68, or a per pupil cost of $12.70.

Management costs will be determined by the number of adopting classes and the degree of supervision and management assumed by the on-board administrator. For an adopting school of three classroom units, management costs are projected at a total of $300.00 or a per pupil costs of $4.00.

If the adopting agency is multi-school, the desirability for providing broader supervisory and management support is suggested; this is to be done on a part-time basis. The estimated cost for twenty-three classroom units housed in three schools is estimated at $1,600.00 total or a per pupil cost of $2.78.

Operational costs are provided for both a three classroom, single school operation and a three school, 23 classroom adoption. The operational cost for a single school adoption is $7.98 per pupil; the operational cost for the three school adoption is $6.28 per pupil.

C. EVIDENCE OF EFFECTIVENESS

Testing and Data Analysis Procedures

Administration, correcting and verification of tests were done by individuals with degrees in Education. None of them were employed by or affiliated with the project or the County.

One of the test administrators rechecked test scoring accuracy and coding of 5% of the tests stratified by grade, schools and tests. A project staff member verified final test data accuracy by reviewing all scores with the norms manual for each test.

Some data analyses were performed by the T-test sub program within the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975). Interpretation was provided by Dr. Garrett Foster and Mr. Gerald Burns of the Department of Educational Research and Evaluation Services, Florida State University. Other analyses were performed utilizing a desk computer.

Data collected in March, 1976, for students enrolled in the second grade, who had been in MARC for three years (K, 1, 2), showed significant differences at the .05 level, on the Stanford Achievement Test, subtests, vocabulary, comprehension, and word study skills, when compared with a control group. However, since no reliable data was available concerning initial equivalence of these groups upon entry to the kindergarten, and since not all MARC materials were available when this group first entered kindergarten, this data was not used in the validation document. The percentile ranks for the mean scores of the MARC students at this grade level were; vocabulary 66th, comprehension 58th, word study skills 56th.

The data for the kindergarten-first grade cohert group were collected in September 1974, September 1975, and March 1976, and therefore reflects two years of participation in Project MARC.

The data for the kindergarten replication group were collected in September 1975, and March 1976, and therefore reflects one year of participation in Project MARC.

Equivalency of treatment and control groups were established utilizing pretests administered to each group.

Table 1
Comparative Analysis
Pretest Achievement and I.Q. Data for the Kindergarten Level
September, 1974

Test	MARC (N=105) $\bar{X}$	MARC (N=105) SD	Control (N=39) $\bar{X}$	Control (N=39) SD	Obtained t	df
Boehm Test of Basic Concepts	26.44	9.55	23.00	11.67	1.805	136
Stanford Early School Achievement Tests						
Letters & Sounds	9.44	5.83	10.11	7.44	.490	136
Aural Comprehension	11.57	5.63	11.28	6.74	.254	136
Kuhlmann-Anderson	88.54	12.56	94.26	21.87	1.47	133

Table 2
Comparative Analysis
Pretest Achievement and I.Q. Data for the Kindergarten Level
September, 1975

Test	MARC $\bar{X}$	MARC SD	Control $\bar{X}$	Control SD	Obtained t	df
Boehm Test of Basic Concepts	29.19 N=153	9.65	28.91 N=44	8.59	.45	195
Stanford Early School Achievement Test	10.28 N=149	6.28	11.53 N=45	6.80	1.10	192
Harrison-Stroud Readiness Visual Symbols	7.70 N=144	7.09	7.20 N=45	6.76	.42	185
Otis-Lennon Test of Mental Maturity	90.89 N=166	16.32	93.31 N=35	13.72	.82	199

PRELIMINARY RESULTS - (ONE YEAR OF MARC)

Table 3
Kindergarten - First Grade Group - One Year of Program
(Project intervention for kindergarten)
September 1975

Hypothesis	Instrument	MARC (N=104) $\bar{X}$	MARC (N=104) SD	Control (N=31) $\bar{X}$	Control (N=31) SD	Obtained t	df
A^1	SESAT II-Letters & Sounds	27.20	11.27	19.39	8.97	**3.58	133
B^1	SESAT II-Word Reading	31.95	6.23	23.55	8.14	**6.12	133
C^1	SESAT II-Sentence Reading	12.50	4.66	10.90	2.99	1.80	133

*Means favor the experimental group. Significance was reached for two of the three subtests.
** $P < .01$ - Two Tailed Test

In two of the three comparisons (Table 3) involving groups who entered Project MARC at the kindergarten level and were in grade one in September, 1975, Project MARC students scored significantly higher than the control students.

The one subtest reported as not significant was sentence reading on the SESAT, Level I. This is a highly complex skill and one which is not emphasized at the kindergarten level where Project MARC intervention occurred. Therefore, this result was not unexpected.

The results are notable in that test scores came from tests given in fall, 1975. Thus the gains made by Project MARC children are not likely to be an artifact due to either teaching to the test or short-term memory of specific instruction. Rather these results should be interpreted as stable indicators of the effects of the total MARC program over a one-year period.

RESULTS - KINDERGARTEN REPLICATION GROUP

Table 4

Documents the Effects of Project MARC for the Kindergarten Replication Group
Kindergarten - Replication Group - One Year of Program
March 1976

Hypothesis	Instrument	MARC (N=146) $\bar{X}$	MARC (N=146) SD	Control (N=34) $\bar{X}$	Control (N=34) SD	Obtained t	df
D	Harrison-Stroud Visual Symbols	17.55	4.59	13.59	7.26	3.17	**178
E	SESAT I-Letters & Sounds	21.45	5.86	18.59	5.92	1.66	***178

*Differences favoring the experimental (MARC) group were significant for both tests.

** $P < .05$ - One Tailed Test

*** $P < .01$ - One Tailed Test

Significant differences were found in two of two comparisons involving groups who entered Project MARC at the kindergarten level and remained in the program for the entire year.

These findings confirm the findings for the K-1 cohert group and reinforces the claim that Project MARC is effective in developing reading readiness for students involved.

FINAL RESULTS - (TWO YEARS OF MARC)

Final data collected in the spring of 1976, substantiates results obtained in September 1975. Table 5 summarizes analyses conducted for children enrolled in the sequential program for grades K-1.

Table 5

Kindergarten - First Grade Group - Two Years of Program
(Project intervention for kindergarten and 1st grade)
March 1976

Hypothesis	Instrument	MARC (N=100) $\bar{X}$	MARC (N=100) SD	Control (N=41) $\bar{X}$	Control (N=41) SD	Obtained t	df
A	SESAT II- Letters & Sounds	37.79	3.15	33.51	6.85	3.82	***139
B	SESAT II-Word Reading	47.61	7.70	37.37	12.71	4.81	***139
C	SESAT II-Sentence Reading	18.81	7.89	15.54	6.71	2.34	**139

*Differences favoring the experimental (MARC) group were significant for all three subtests.

** $P < .05$ - One Tailed Test

*** $P < .01$ - One Tailed Test

Significant differences were found in all three comparisons involving groups who entered Project MARC at the kindergarten level and followed a sequential program of development through grade 1, whereas no differences existed between groups two years earlier.

The evidence suggests that the impact of Project MARC is highly significant in educational terms for many reasons: (1) it emphasizes early school intervention and a sequential developmental reading program; (2) it provides a viable alternative program for rural and/or low socio-economic, low achieving students for whom commercial materials might not otherwise be suitable; (3) it meets a critical need, that of reading achievement which is the basic tool upon which other school achievement is based; (4) the results obtained represent knowledge gained during the school year and maintained over the summer months.

An incidental finding which may be considered as educationally significant, deals with the comparison of intelligence scores of the two groups. Intelligence test scores have been utilized throughout the project implementation to compare control and experimental abilities at various grade levels.

Although students appeared to be initially equivalent in this area when tested under standardized conditions, scores on the Otis-Lennon Test of Mental Maturity analyzed after a two-year program of intervention indicated significant differences favoring the experimental group.

While the project does not claim to have altered intelligence as distinct from reading ability, this finding does support the contention that Project MARC students will have a greater capacity to succeed in academic school endeavors than will the students who have not received this program.

Based on the above findings, it is concluded that Project MARC is an effective K-1 reading program for rural, low SES children. In addition, results obtained for children with only one year of participation in Project MARC indicate that one year of exposure to Project MARC is of definite benefit at the K level. The fact that the preliminary results of a one-year program were obtained in September indicates that MARC control differences are not limited to short term retention or unduly influenced by highly specific instruction.

D. EVIDENCE OF RESOURCE SPECIFICATIONS

The total amount of monies necessary to provide for all aspects of the program have been documented through the validation process. In considering the adoption of MARC, a user should recognize that the producers assume the availability of some audio-visual equipment such as the tape recorder or record player. While not absolutely necessary for project implementation, they would enhance the establishment of instructional centers in the classroom. Costs are reported in section "B" of this document.

E. EVIDENCE OF EXPORTABILITY

This program could be exported to serve the needs of a district, school, grade level, classroom, groups within a classroom, or an individual student in a remedial laboratory situation.

It serves a critical need by providing a reading program utilizing a combination of multisensory techniques, a phonetic-linguistic sequential series, teacher training, and content materials particularily relevant to the rural low achieving student. These materials would also be of value to non-rural children with low reading achievement levels.

Materials for teacher training and classroom implementation are provided in the inservice packets, tapes and guides. Preservice training should be provided for teachers through on-site sessions or through training of a coordinating head teacher or principal at the adopter site.

It is also feasible that a person trained in reading techniques might utilize the program with little additional training.

F. LOCALLY DESIGNED MATERIALS

Materials designed for the program have been listed under the Program Description section of this application.

G. UNANTICIPATED OUTCOMES

1. An expressed willingness on the part of teachers to try new methods and approaches
2. A positive attitude on the part of teachers toward their ability to teach reading
3. An increase in student motivation and an expressed positive attitude toward reading
4. A unified curriculum within each school resulting in increased team teaching and cross-grouping of students.
5. A tendency on the part of teachers to individualize teaching in other areas particularly math, based on student needs
6. Increased inter-communication of classroom teaching ideas such as games and center activities among teachers.

H. VALIDATION TEAM REPORT

1. Conclusions and recommendations

The validation team unanimously validated the project as an effective and exportable innovative program. The project received top scores on all items.

EFFECTIVENESS/SUCCESS

The findings of the validation team were that; the objective was measurable; the need assessment conducted confirmed both the appropriateness of indicators and discrepancies; the data collected was verified; and procedures for collection and interpretation were considered appropriate. They also found that the project was effective in addressing the identified need and that the attainment of the stated objective was due to project activities.

RESOURCE SPECIFICATIONS

The validation team reported that costs stated in this document related to start up, operational, management, and per learner, reflected a true representation of actual costs.

They also found that the variety and excellence of instructional materials which generated most of the cost figures firmly established MARC as a reasonable and quality investment.

EXPORTABILITY

The validation team found the project served a critical need; that of basic reading instruction. In adopting it the county must utilize the developed materials. Also it must insure that a teacher or key person receive training from the Wakulla County project prior to program implementation. A five day session is recommended although a person proficient in the teaching of reading may not require this intensive a training period. Staff development in a district adoption is very important and should be included in the program plan. Factors reported which support the project's viability for dissemination are:

1. Rationale for selection of the K-2 target group
2. Adequacy and availability of the total program of teacher-use and student-use materials.
3. The training and follow-up consultations available (staff competencies)
4. The economical costs of adoption and the educational gains to the expected.